

PATENT SPECIFICATION



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COMPLETE SPECIFICATION

Improvements in or relating to Combined Silencers and Air Filters for Motor-cycle Engines

I, ALFRED KNECHT, of German nationality, of Am Kriegsbergturn 31, Stuttgart-Nord, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement :—

The invention relates to a combined silencer and air filter for motor-cycles. It is the object of the present invention to provide a space-saving filter, using known shapes of casings, which ensures a high efficiency in silencing noise as well as in filtering, and is very easy to service.

The filters hitherto used in the equipment of motor-cycles are of the type where the filter insert consists of a cartridge, which can be wetted with oil and consists of stacked perforated disks made of, say, expanded metal, or it consists of a metal fabric filling held between metal plates or grid plates.

The filter cartridges must be cleaned in a petrol bath and soaked in oil occasionally. It is known that if the aspirated air is blown back, oil drops and parts of the combustible mixture are blown out of the filter casing, fouling it and making the driver's clothes dirty.

In liquid-filters for motor cycle engines expendable filter inserts are being used to an increasing extent, because this simplifies the servicing of the filter on the road, when it is only necessary to detach a part of the casing and to exchange the filter insert.

Another important disadvantage of the air filters equipped with filter cartridges which had to be wetted with oil is the fact that any disturbances in operation due to the fouling of the filter could not be remedied on the road so that in cases of necessity the engine had to be run on unfiltered air after removal of the filter cartridge.

The expendable and replaceable filter inserts for air cleaners for motor-cycle engines

consist preferably of a radially pleated annular body of paper material covered at the end faces thereof and, if necessary, also protected along its circumference by a perforated cardboard sleeve against damage. The cover plates in this design are equipped with resilient rings serving to connect the filter to ducts conveying the medium which is to be filtered and preventing at the same time disadvantageous effects of pressure against the paper material insert, e.g., a deformation which interferes with the operation of the filter.

The absence of such resilient components in the air filters which have become known hitherto for motor-cycle engines may be regarded as one of the reasons why metal filter cartridges which can be wetted with oil were retained and the disadvantages connected with their use, as mentioned above, were tolerated.

And the filter is a radially pleated annular body of paper material, the circumferential surface of the body being protected by a thin-walled annular metal sleeve with turned-over or flanged peripheral edges. The invention consists in a combined silencer and air filter for motor-cycle engines, in which the casing comprises two parts, i.e. a housing and a cover, held together by the clamping pressure of quick-acting clamps, one of the casing parts being designed to act as a silencer, and the central opening in the body due to the folding of the paper material being closed by an insert. This insert may be formed as a cap or as a plug and may be made of thin sheet metal or of paper material.

The part of the casing of the air filter according to the new design forming the air inlet side can be equipped in a known manner with a regulatable choke. It is also possible to retain the parts of casings used hitherto, with the wall fittings producing or promoting the silencing effect, so that the action of air filters of this type which are al-

ready in use and equipped with filter cartridges wetted with oil, can be improved by replacing the metal cartridge by a paper material cartridge according to the invention, with an increased filter surface due to the radial pleating and protection of the circumferential area.

In order that the invention will be clearly understood and readily carried into effect, the same will now be described more fully with reference to the accompanying drawings, in which :—

Fig. 1 is a perspective view of an exchangeable filter insert, made of radially pleated paper material with an annular protection sleeve along the circumferential area and covered central aperture;

Fig. 2 is a partial longitudinal section of a combined silencer and filter with a choke in the one part of the casing and silencer tube fitting in the other part of the casing;

Fig. 3 is a side view, partly a cross-section, through the air filter according to Fig. 2;

Fig. 4 is a longitudinal section, partly a side view, of a simple design, where in the cap-shaped upper part of the casing an annular body or a body having the shape of a ring section is provided to form a silencer channel;

Fig. 5 is a part longitudinal section of a filter which can be pushed over the suction connection of the carburetter and whose upper casing part is equipped with a starter choke, while the bowl-shaped lower part of the casing is blended into a pipe connection fitting;

Fig. 6 is a plan view of the filter according to Fig. 5, whose upper casing part is partly broken away, and

Fig. 7 is a cross-section along the line A-A of Fig. 6.

The filter insert, Fig. 1, which is to be thrown away and replaced when it is fouled, consists of an annular body 1 of paper material which is radially pleated, i.e. has radially disposed corrugations, and is surrounded by a thin-walled annular metal sleeve 3 whose edges 2 are turned in or flanged inward, and the central aperture resulting from the method of folding the paper material is closed by a covering insert 4.

In the design according to Fig. 2, a filter of this type is gripped between a housing 5, acting as a silencer, and a cover 6, which is provided with a choke plate 8, rotatable by means of a handle 7, and which controls the air inlet openings 9. A tubular cap 10 is provided to cover the central aperture of the filter 1. A funnel-shaped insert 11 is provided in the housing 5 to guide the air flowing in; this insert acts in conjunction with the tube 13, carried by the insert and if necessary provided with rows of holes 12. The air leaves through the pipe connection 14 in the housing 5. The parts of the filter casing are

clamped together by means of known types of quick-acting clamps 15.

In the filter 1 of the example of a design according to Fig. 4 the central aperture is closed by a plug-shaped insert 16, which can also be made of paper material and thus be utilized for the filtering of air. The tube 18, which is to be fixed to the carburetter suction pipe by means of a pipe clamp 17, is widened so as to form an annular edge 19 on which the annular sleeve 3 is placed, so that the tube 18 forms a supporting shoulder. The upper part or cover 20 of the casing covering the annular edge 19 is shaped by means of an insert 21, forming an air duct 22, so as to act as a silencer. A punched opening 23 is provided for the admission of air. The clamping is effected by means of quick-acting clamps.

In the design according to Fig. 5 a tubular cap 25 formed of paper material is provided as a cover for the central aperture of the filter. The bowl-shaped housing or lower part 26 of the casing is blended into the connection piece 27, which is to be clamped by means of a pipe clamp 28 to the carburetter air suction pipe. Quick-acting clamps 29 clamp the lower part 26 of the casing to the upper part 30, to which the choke disk 31, provided with a handle 32 and controlling the air apertures 33, is fixed. The housing or lower casing part 26 acts as a silencer, in conjunction with the space between the top surface of the filter 1 and the disk 31.

What I claim is :—

1. A combined silencer and air filter for motor-cycle engines, in which the casing comprises two parts, i.e. a housing and a cover, held together by the clamping pressure of quick-acting clamps, one of the casing parts being designed to act as a silencer, and the filter is a radially pleated annular body of paper material, the circumferential surface of the body being protected by a thin-walled annular metal sleeve with turned-over or flange peripheral edges and the central opening in the body due to the folding of the paper material being closed by an insert.

2. A silencer and air filter according to Claim 1, in which the insert closing the central aperture in the filter has the shape of a tubular cap.

3. A silencer and air filter according to Claim 1, in which the insert closing the central aperture in the filter has the shape of a plug.

4. A silencer and air filter according to Claims 1 to 3, in which the insert closing the central aperture in the filter consists of paper material.

5. A silencer and air filter according to Claims 1 to 4, in which the part of the casing designed as a silencer is equipped with a fitting acting as a guide for the air flow.

6. A silencer and air filter according to

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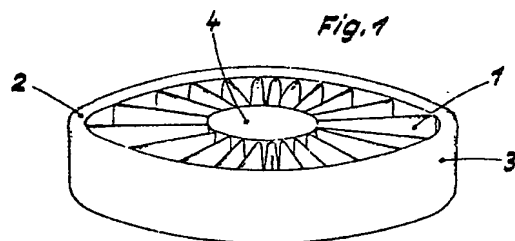
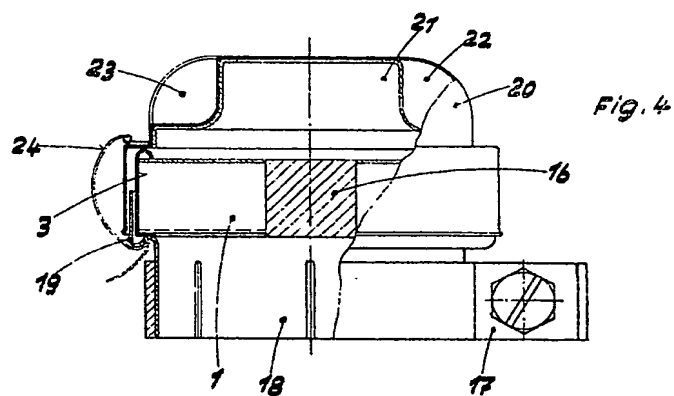
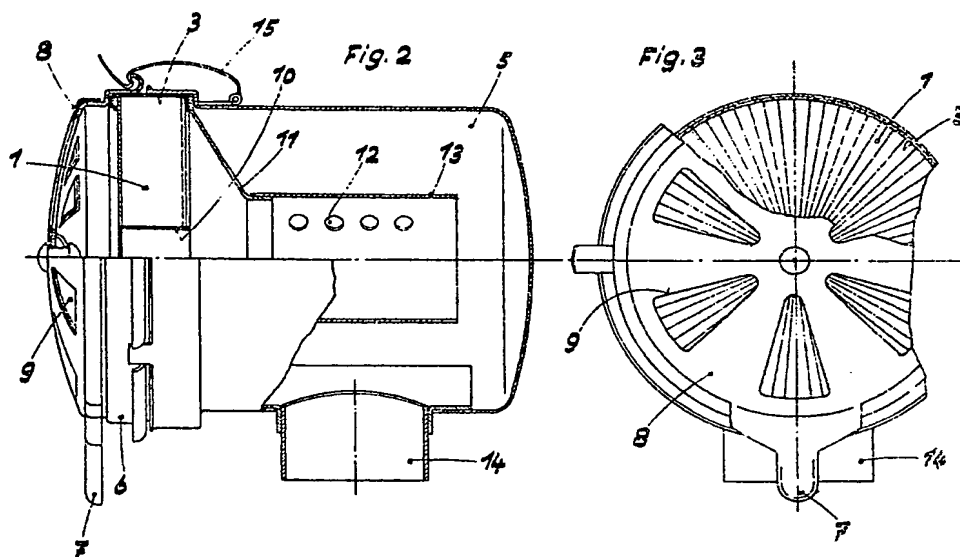
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Claims 1 to 5. in which the cover is connected in a known manner to a choke plate so as to control passage openings.

7. Combined silencers and air filters substantially as described with reference to the accompanying drawings.

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COMPLETE SPECIFICATION

2 SHEETS

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SHEETS 1 & 2

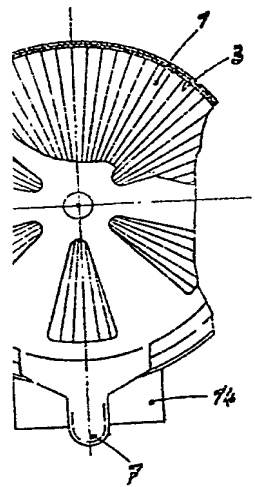


Fig. 4

16



1

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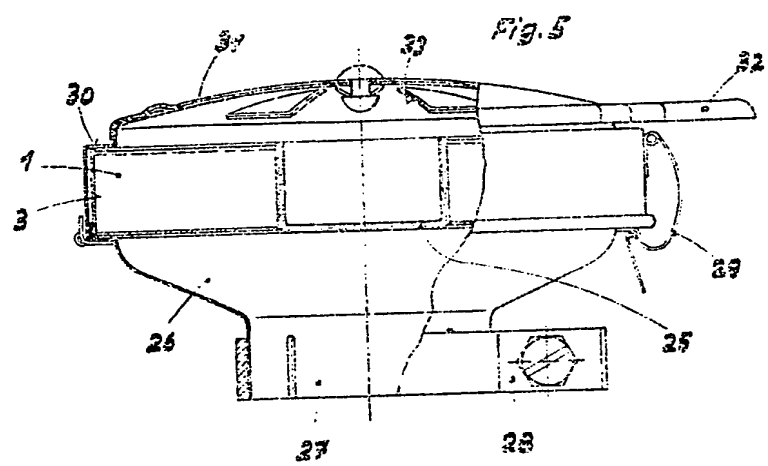


Fig. 5

Fig. 7

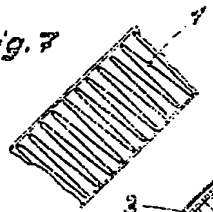
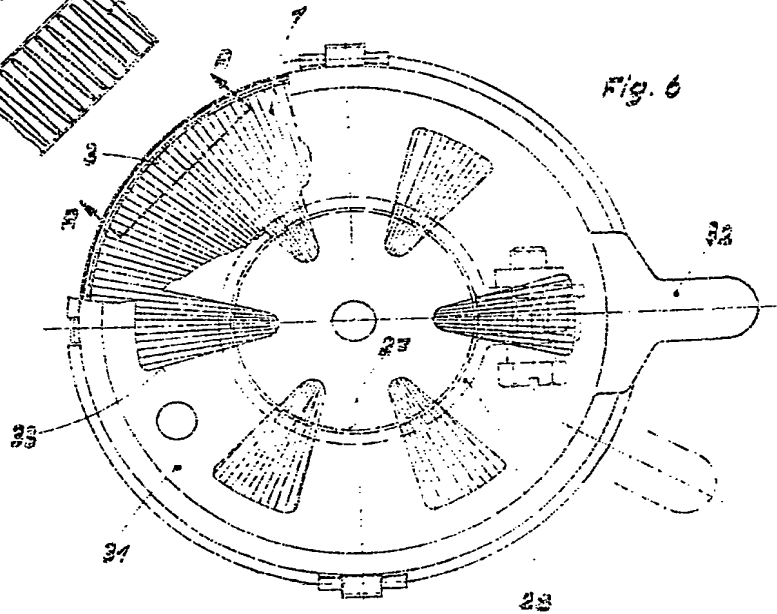


Fig. 6



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2 SHEETS This drawing is a reproduction of
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SHEETS 1 & 2

